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Document 12.8 Decontamination and Disposition of Process-Contaminated Facilities and Associated Equipment

(Formerly H&SM Supplement 2.30)

Recommended for approval by the ES&H Working Group

Approved by: Robert W. Kuckuck
Deputy Director for Operations

New document or new requirements

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12.8

Decontamination and Disposition of Process-Contaminated Facilities and Associated Equipment*

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12.8

Decontamination and Disposition of Process-Contaminated Facilities and Associated Equipment

1.0 Introduction

1.1 Purpose and Scope

The document describes the decontamination and disposition (D&D) process for physical assets (i.e., facilities and equipment) that have become contaminated during the performance of work, and the responsibilities of individuals who perform D&D work. This process shall be applied using a "Non-Time-Critical Removal Action" approach, tailoring the controls outlined in this document—based on the type and extent of contamination identified within the facility—to fit the specific operation. Details of this approach should be negotiated with the ES&H Team.

The primary objectives of the D&D process are:

1. To ensure, as a minimum,
    - Application, as appropriate, of guidelines contained or referenced in DOE-STD-1120-98, "Integration of Environment, Safety and Health into Facility Disposition Activities."
    - Disposition of contaminated facilities, including deactivation, surveillance and maintenance (S&M), and decommissioning activities, are planned, conducted, and documented in a manner consistent with LLNL's Integrated Safety Management (ISM) System.
2. To provide for
    - Collection of baseline data to support a physical, chemical, and radiological characterization, updated as necessary to reflect changes in facility conditions during the disposition process.
    - Surveillance and maintenance activities that correspond with facility conditions, including changes resulting from disposition activities.
    - Identification, assessment, and evaluation of alternatives for deactivating or decommissioning and for selecting and documenting a preferred alternative.
    - A process in deactivation and decommissioning planning that identifies specific facility endpoints and activities needed to achieve those endpoints.
    - A detailed engineering plan, including documentation to execute the preferred deactivation or decommissioning alternative.

For purposes of this document, the term "process contamination" is defined as contamination (radioactive, chemical, explosive, or biological) that has occurred because of project activities. "Decontamination and disposition" is the process of removing contamination from project facilities and associated equipment for reuse or salvage, or disposing of contaminated facilities that cannot be successfully decontaminated for reuse. The term "facility" refers to either a facility or part of a facility. Other terms and definitions can be found in Appendix A.

1.2 Background

1.2.1 General Information

The Department of Energy (DOE) has developed a process to address the various elements of disposition. This process includes the transition of operations to deactivation and decommissioning as well as continuing S&M throughout the disposition phase. This process also includes S&M that may be conducted as a stand-alone activity after deactivation activities have been completed and prior to commencing decommissioning.

Transition activities occur between the operations and disposition phases in a facility's life cycle. Transition begins once a facility has been declared or forecast to be excessed for current and future DOE needs. It includes placing the facility in stable and known conditions, meeting permitted requirements if applicable, identifying hazards, eliminating or mitigating hazards, and transferring programmatic and financial responsibilities from the operating program to the disposition program. Timely completion of transition activities can take advantage of facility operational capabilities before they are lost, allowing DOE to eliminate or mitigate hazards in a more efficient, cost-effective manner. In preparation for the disposition phase, it is important that material, systems, and infrastructure stabilization activities be initiated prior to the end of facility operations.

Deactivation of the facility usually occurs following operational shutdown and transition. The purpose of deactivation is to place a facility in a safe shutdown condition that is economical to monitor and maintain for an extended period, or until the eventual decommissioning of the facility. Deactivation of contaminated, excess facilities should occur as soon as reasonable and for as many facilities as possible. In this way, DOE can apply its resources in a manner that accomplishes the greatest net gains to safety and stability in the shortest time. Deactivation places the facility in a low-risk state with minimum S&M requirements.

Typically, the facility is taken to its ultimate end state through decontamination or dismantlement during the decommissioning phase. After decommissioning is complete, the facility or surrounding area may require DOE control for protection of the public and the environment or for environmental remediation.

S&M activities are conducted throughout a facility's life cycle, and when that facility is inoperable and is not expected to operate again. Near the end of a facility's life cycle, it is important to ensure that S&M is adequate to maintain the facility safety envelope during the final stages of operations through a seamless transition to final disposition of the facility. S&M is adjusted during the facility life cycle as transition, deactivation, and decommissioning activities are completed. S&M activities include periodic inspections and maintenance of structures, systems, and equipment to ensure that, at a minimum, any contamination is adequately contained and that the potential hazards to workers, the public, and the environment are eliminated or mitigated and controlled.

1.2.2 Mechanisms for Funding Decontamination and Disposition Work

There are 4 mechanisms for funding D&D work, as listed below. DOE uses the first three and the Laboratory uses the fourth:

1. The Council on Strategic Operations (CSO) can directly fund the D&D plan and work.
2. The DOE Environmental Restoration and Waste Management (EM) can provide funding for the Laboratory to prepare the plan and carry out the work.
3. EM can prepare the plan, with input from the Laboratory, and contract for the work directly.
4. The Laboratory may undertake small D&D projects on its own initiative. For example, a facility Associate Director (AD) may decide to perform the work using resources (usually from operating funds) available to the Laboratory.

More details on funding and administrative issues can be found in *Policy and Procedures for the Disposition of Space*, SSP-99-0044-SB (this document intended for Internal Use Only), March 1997.

http://www-r.llnl.gov/plant_eng/siteplan/space_dispos.pdf

2.0 Hazards

Improper planning or execution of facilities and equipment D&D could lead to workers being exposed to unidentified hazards.

3.0 Controls for Decontamination and Disposition of Facilities and Equipment

3.1 Identifying Process-Contaminated Facilities and Equipment

Determining whether or not a facility is process contaminated is highly variable and often requires an evaluation by subject-matter experts. Thus, the following factors shall be considered:

- The type of material and amount of contamination. Certain combinations of contamination may also be considered in determining whether or not a facility is process-contaminated.
- The location of contamination in the facility. For instance, contaminated air-conditioning ducts might qualify as contaminated equipment, but the facility may not be classified as contaminated.
- The intended use of the facility. For instance, if a chemistry laboratory in which minor, routine spills occur will continue to be used for its intended purpose, that laboratory might not be contaminated. If, however, the facility will be converted into an office, then it would be considered to be process-contaminated because different regulations would apply to its new intended use.

The environment, safety, and health (ES&H) Teams also can provide clearance levels for various substances to help determine whether or not a facility or piece of equipment is process contaminated. In addition, refer to Document 12.7, "Shutdown or Transfer of Facilities, Operations, or Associated Equipment," in the *ES&H Manual*.

3.2 Documentation

Depending on the funding source (see Section 1.2.2), the development of a final report or equivalent document for each deactivation or decommissioning project may be required. Where deactivation and decommissioning are conducted as a single, uninterrupted activity, only one final report is necessary.

Facility management shall maintain records to identify historically significant safety hazards and areas of contamination, and to assist with characterizing buildings for D&D and Federal Resource Conservation and Recovery Act (RCRA) closures, if applicable.

3.2.1 Contamination File

A contamination file is required for all process-contaminated facilities and equipment. For a radioactively process-contaminated facility, the file shall contain the type,

location, and level of contamination found within the facility or on associated equipment. It also may contain or reference operational records, Facility Safety Plans (FSPs) or Integration Work Sheets/Safety Plans (IWS/SPs), Occurrence Reports, Incident Analysis Reports, spill reports, notes, drawings, key plans, characterization reports, environmental/regulatory requirements (e.g., RCRA closure), and other similar documents associated with the facility. The ChemTrack database may contain useful information for the file. For nonradioactively contaminated facilities, the requirements for a file can be met using existing records such as those described in this subsection.

The facility AD will assign an individual (e.g., facility manager or facility point of contact) who will maintain contamination files in accordance with Appendix B and Document 12.7.

3.2.2 Contamination Summary

A Contamination Summary briefly outlines the current condition of a facility, or portion of a facility including equipment therein. It is usually required when:

- A process-contaminated facility is transferred from one directorate to another.
- A facility is placed in a surveillance and maintenance mode, or analyzed for D&D.

Appendix B provides specific guidance for preparing a Contamination Summary.

3.2.3 Implementation Plan

An Implementation Plan is required before beginning D&D work. The facility AD may specify the format of the plan for internally funded D&D projects. (Appendix C of this document contains detailed information on preparing the plan.) For externally funded projects, the DOE funding source determines the format, guidelines, and responsibility for the plan.

3.3 Decontamination and Disposition Work Planning Process

This section describes the D&D work planning process, with subsections on the factors to consider and the planning stages.

3.3.1 Decontamination and Disposition Factors to Consider

The level of D&D effort required for process-contaminated facilities and equipment depends on factors such as:

- The types and amount of contaminants.

- The physical and chemical forms of contaminants.
- Type and location of existing mechanical, electrical, process and service utilities.
- The types of activities conducted in the facility (e.g., chemical processing, waste management, handling of fine powders and material in solid form, and the use of corrosive materials or unencapsulated radioactive materials).
- The extent of contamination in engineered confinement systems, including hoods, gloveboxes, stacks, filters, ventilation ducting, piping, and retention tanks.
- Spills, releases, or fires that may have caused contaminants to disperse outside normal confinement structures, or stained or cracked secondary containment structures, or created hazardous or mixed wastes.
- The incorporation or distribution of fixed radioactive or hazardous materials in facility structures (e.g., fixed-surface contamination covered with paint, or activation of containment vessels or shielding).
- The size and age of the facility, construction of the facility, types of material contaminated (e.g., asphalt, concrete, stainless steel, rubber, plastic), and number of rooms in the facility.
- Availability of records or knowledgeable personnel who have worked in the facility.
- The amount of equipment that will be subject to the D&D effort.
- The volume and characteristics of the D&D waste generated.
- Potential personnel hazards (high-radiation fields or very high levels of contamination) that may be encountered during the D&D effort.
- The presence of other-than-process-contaminated hazardous materials (lead, PCBs, or asbestos) that would complicate the D&D effort.
- Use of the facility for permitted management of hazardous or mixed waste.
- Options and certification for disposal of low-level waste generated during D&D activities.

The D&D effort for a specific facility can range from a relatively simple task to a very complex operation based on the D&D factors described above. For example, more costly and complicated D&D efforts will require a comprehensive Implementation Plan. Consider the following examples:

1. A facility containing only a few laboratories where small quantities of radionuclide, chemical, or biological materials are used on bench tops or in hoods may require a

relatively simple Implementation Plan and other project-planning documents (e.g., a contamination file detailing any permanent contamination and its location for the operational life of the facility). The contamination file is reviewed and updated, and then a Contamination Summary is prepared. If D&D is deferred, and the facility will no longer be used, a Surveillance and Maintenance Plan will be developed in accordance with Document 12.7. If D&D should proceed, it may either be funded in-house or externally. *Funding and Plans for Decontamination*, which can be obtained from the AD facility manager, contains details on obtaining funding for D&D activities.

2. A facility that uses many separate laboratories to handle high levels of transuranic radionuclides, explosives, or carcinogens would require a more comprehensive Implementation Plan and other planning documents. Operations involving these materials usually require the use of highly contaminated gloveboxes, ventilation ducting, high-efficiency particulate air (HEPA) filtration systems, piping, and liquid waste and retention systems to prevent contaminants from escaping.

3. Process-contaminated equipment that may be in an otherwise noncontaminated facility only would require labeling or tagging with the contaminant and surgical removal to render the building non-process contaminated.

3.3.2 Decontamination and Disposition Planning Stages

D&D planning involves 3 stages:

1. **Reviewing the condition of the facility.** This involves evaluating historical files, records, and Contamination Summary, which outlines the current condition of the facility.

2. **Preparing the necessary ES&H review documents**, such as those required by the National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA). Identify all permits associated with the facility (e.g., BAAQRB, RCRA, etc.).

3. **Preparing an Implementation Plan.** When a decision is made to proceed with D&D, an Implementation Plan shall be developed describing the D&D work, the budget, schedules, provisions for ES&H analyses, and required documentation (e.g., permits). D&D work must be done in accordance with ES&H policies; requirements in the *ES&H Manual;* medical surveillance requirements specified by the Health Services Department; training requirements; and the Work Smart Standards.

The ES&H Teams have important roles in the planning and implementation of D&D work. Thus, the facility AD shall consult with the area ES&H Team as early as possible during the planning phase for assistance with obtaining safety and NEPA

documentation, including permits, and making the necessary arrangements for waste generation, storage, treatment, and disposal.

3.4 Releasing Contaminated Facilities and Equipment

The area ES&H Team can determine acceptable contamination levels for the unrestricted release (see Appendix A for definition) of process-contaminated facilities and equipment. A facility or equipment may be released to another directorate under restricted conditions if the contamination is reduced to an agreed-upon level or if the receiving directorate accepts the facility after reviewing the Contamination Summary. Residual contamination levels, their records, and the verification criteria shall be established and approved by the facility AD.

Process-contaminated facilities scheduled for D&D shall be evaluated for the presence of hazardous construction materials such as asbestos, lead, and polychlorinated biphenyl (PCB). These materials must be managed appropriately during D&D activities in accordance with requirements in the *ES&H Manual*. The area ES&H Team also can provide additional guidance and information.

3.5 Buildings to be Permanently Mothballed or Demolished

This section discusses general, specific ES&H, and S&M requirements for buildings to be permanently mothballed or demolished.

3.5.1 General

Contact Space and Site Planning for institutional requirements when buildings are deemed excess to program needs. Further guidance on retiring or demolishing buildings can be found in *Policy and Procedures for the Disposition of Space*.

3.5.2 Specific Environmental, Safety, & Health Requirements

In addition to the requirements in Document 12.7, the requirements below apply to buildings being placed into permanent mothball, or those having their mothball status changed to permanent, or those being demolished.

- Contact the area Fire Protection Engineer to determine what specific operational controls and system modifications are required to protect workers, the environment, and property during the building's end of life cycle transition. Previous controls employed during temporary mothballing may be inadequate for permanent mothball and similarly, may be inadequate during demolition.

- For permanent mothball, submit a draft Shutdown, Surveillance, and Maintenance Plan (SSMP) to the ES&H Team requesting a full discipline review to ascertain the proper level of Discipline Action Plan and Team Action Plan requirements necessary to meet the changing status. The following actions must be addressed and approved prior to the permanent status change.
  - — Evaluation of the buildings Safety Basis Envelope
  - — Re-evaluation of Plant Engineering scheduled maintenance services
  - — Completion of a new or updated SSMP
- For buildings undergoing demolition, a draft plan outlining the scope of work accompanied by the buildings historical contamination file shall be submitted to the area ES&H Team for a full discipline review.

3.5.3 Surveillance and Maintenance

Once a building's status has been changed to permanent mothball status pending demolition, surveillance and maintenance activities for that building shall be identified, documented in a current SSMP, with implementation the responsibility of the owning AD. Instructions for preparing a SSMP are in Document 12.7. For general industry classified facilities, the SSMP will serve as the building-controlling document.

Work activities in the building shall be controlled utilizing the approved SSMP, which shall specify the frequency and scope of ES&H monitoring, building maintenance, and access control and restrictions. The SSMP may replace or be used in conjunction with an updated FSP or IWS/SP. The need for a separate FSP or IWS/SP shall be determined based on residual hazards, inventory and the coverage of the SSMP for work activities and control of hazards.

4.0 Responsibilities

General responsibilities for all workers are described in Document 2.1, "Laboratory ES&H Policies, General Worker Responsibilities, and Integrated Safety Management," in the *ES&H Manual*. Specific responsibilities for D&D work are listed under each title.

4.1 Facility Associate Directors

- Maintain records, collect information for D&D planning, and monitor the condition of process-contaminated facilities. (The Facility AD Report, issued by Space and Site Planning, lists the facilities assigned to each AD.)

- Assemble and maintain contamination files on all existing process-contaminated facilities in order to minimize sampling costs and waste generation during D&D. This includes
  - — Maintaining existing operational records that will facilitate D&D activities and help in the reduction of radioactive, hazardous, and mixed waste generated during D&D activities. Operational records may include facility design drawings and modification records, reports containing characterization data on contamination levels and prior decontamination activities (e.g., swipe history, spill maps of known contamination), and occurrence and incident analysis reports.
  - — Updating contamination files whenever a significant change affects process-contaminated facilities and associated equipment.
- Plan D&D activities. This includes
  - — Preparing a Contamination Summary, as described in Appendix B, whenever a process-contaminated facility or an area containing process-contaminated equipment is to be vacated.
  - — Establishing and maintaining a current surveillance and maintenance program in accordance with Document 12.7 and National Emission Standards for Hazardous Air Pollutants (NESHAP).
  - — Consulting the area ES&H Team (and any other Program AD involved) for guidance on minimizing the generation of radioactive, hazardous, and mixed wastes and protecting workers, the public, and the environment.
  - — Establishing and implementing an ES&H review process for obtaining the necessary permits, following requirements for RCRA closures if applicable, and ensuring regulatory compliance.
  - — Preparing estimates for the sampling and characterization of contaminated areas.
  - — Preparing estimates for projected waste-generation activities associated with the D&D effort.
  - — Estimating the amount and types of materials proposed for reuse or recycling.
- Obtain guidance from the Environmental Protection Department (EPD) for developing a strategy to meet long lead-time regulatory requirements.
- Have transuranic (TRU) and low-level waste certified.
- Secure an avenue for disposal or obtain a DOE exception before generating hazardous waste.

4.2 Program Associate Directors

A Program AD who conducts process-contaminating operations in the facility of another AD shall:

- Provide that facility AD with the necessary data to be included in his or her contamination files during and upon completion of operations.
- Deactivate areas involved in the operations and, if appropriate, prepare a Shutdown, Surveillance, and Maintenance Plan in accordance with Document 12.7.
- Assist in preparing a Contamination Summary for areas vacated.

The handling and storage of hazardous, radioactive, and mixed waste are major concerns of the Laboratory. Therefore, the Program AD must make every effort technically and economically feasible to:

- Reduce the amount of waste generated.
- Have low-level radioactive waste streams certified.
- Secure adequate waste storage.
- Establish disposal options.

4.3 Environmental Protection Department

Personnel in the EPD have responsibility for:

- Handling, packaging, and processing radioactive, chemical, explosive, biological, hazardous, and mixed waste.
- Interpreting and implementing NHPA and NEPA requirements and other federal, state, and local regulations.
- Preparing waste-handling documentation.
- Obtaining regulatory permits.
- Assisting with pollution prevention activities.

The EPD shall partner with the Hazards Control Department and facility and program management to jointly evaluate and characterize D&D plans to streamline sampling for environmental release, and to ensure worker safety and cost effectiveness. This involves:

- Identifying regulatory and permit requirements for facility and program ADs and ensuring compliance with these requirements.

- Preparing the necessary environmental review documents (permit applications, closure plans, and reports). If environmental permits are required for any phase of D&D, the conditions of the permits shall be negotiated with the regulatory agencies involved.
- Preparing closure plans, sampling plans, conducting sampling, and determining analytical requirements for both safety and environmental disposal.
- Evaluating sampling data, characterize waste for disposal, and identify waste disposal options for waste generated from D&D activities.
- Working with the facility AD to develop a waste certification procedure for the disposal or treatment of waste in the D&D waste streams.
- Recommending that waste handling, packaging, and processing procedures are included in Implementation Plans.
- Identify waste disposal requirements and options.

4.4 Hazards Control Department

Provide the following to programs and facility management as appropriate:

- Assistance in identifying potential hazards and the appropriate controls to reduce the risk to workers who perform D&D work.
- Assistance in developing required safety documentation (e.g., Implementation Plans and IWS/SPs).
- Assistance in preparing sampling plans and in determining analytical requirements for worker safety.
- Guidance on characterizing contaminated facilities or equipment, evaluating the potential hazards associated with the characterization and implementation phases of the D&D process, and specifying the appropriate safety controls.
- Surveillance and monitoring of activities during each phase of the D&D process.
- Copies of FSPs or IWS/SPs and other records that may be helpful in preparing the Contamination Summary and Implementation Plan.
- Clearance levels for restricted or unrestricted release of equipment.

4.5 Health Services Department

The Health Services Department shall provide medical surveillance programs for LLNL employees who perform D&D work.

4.6 Plant Engineering

Maintain design, modification, and technical drawings of real property installed equipment at LLNL.

Provide technical assistance in areas of construction, estimation, contracting, and engineering options and assist with estimating for the development of the D&D plan.

4.7 Materials Management

All accountable amounts of controlled material have been removed or secured, and any new amounts of material if found during D&D are reported to Materials Management for Material Control and Accountability (MC&A) purposes.

5.0 Work Standards

DOE Order 430.1A, "Life Cycle Asset Management."

DOE 5400.5, Chapter II, Section 5, "Release of Property Having Residual Radioactive Material."

6.0 Resources for More Information

6.1 LLNL Contacts

For further information regarding D&D work, contact the following:

- Directorate Assurance Manager.
- Facility manager.
- ES&H Teams.
- Institutional facility manager.

6.2 Other Sources

29 CFR 1910.1020, "Employee Access to Medical Records."

29 CFR 1910 Subpart Z, Toxic and Hazardous Substances (29 CFR 1910.100 to 1910.1450)

DOE-STD-1120-98, "Integration of Environment, Safety and Health into Facility Disposition Activities."

DOE G 430.1-3, "Deactivation Implementation Guide."

DOE G 430.1-4, "Decommissioning Implementation Guide."

Appendix A

Terms and Definitions

Contamination files	A generic term used in this document to encompass the various types and forms of contamination information for a facility. Contamination files may contain or reference operational records pertinent to process contamination, FSPs or IWS/SPs, Occurrence Reports, Incident Analysis Reports, spill reports, notes, drawings, key plans, and any other information that would locate and identify contamination in the facility. The form, style, and size of the files, as well as where the files are to be stored, are not specified.
Contamination summary	A one- or two-page document outlining the current condition of a contaminated facility. Appendix B contains guidance for preparing a Contamination Summary.
Decontamination	The removal or reduction of residual radioactive and hazardous materials by mechanical, chemical, or other techniques to achieve a stated objective or end point.
Disposition	Those activities that follow completion of program mission, including, but not limited to, surveillance and maintenance, deactivation, and decommissioning.
Endpoint	The detailed specification of conditions to be achieved for a facility's spaces, systems, and major equipment. Risk reduction through elimination or stabilization of hazards, effective facility containment, and facility monitoring and control are fundamental to the determination of endpoints.
Hazardous waste	Wastes determined to be hazardous by the Federal Resource Conservation and Recovery Act (RCRA) or by the State of California.

Implementation Plan	A plan that describes the actual work to be performed in a facility and methods for complying with DOE and other ES&H regulations governing waste handling. This plan should be based on an evaluation of all contamination sources identified within the facility. It also shall include data from the contamination files and detailed budgets and schedules.
Mixed waste	Waste containing both radioactive and hazardous components, as defined by the Atomic Energy Act and the RCRA.
Mothballed Facility, Permanent	A facility for which a decision has been made that final disposition is demolition but funds are not currently available.
Operation	A program, series of experiments, or function dedicated to a specific mission.
Pollution prevention	Materials, processes, and practices used to reduce or eliminate the generation or release of pollutants, contaminants, hazardous substances, and waste into land, water, and air.
Process contamination	A facility (and equipment) that has been contaminated by the processes conducted therein. This includes radioactive, chemical, explosive, or biological contamination. This term is limited to materials and quantities declared to be hazardous by federal, state, and DOE regulations. It does not include materials used in the construction of the facility or background constituents that are indigenous.
Program property personal equipment	Movable items, such as equipment, that are not permanently affixed to or considered to be an integral part of the real property. Generally, items remain personal property if they can be removed without serious injury either to the real property or to the items themselves.
Radioactive waste	Solid, liquid, or gaseous materials containing radionuclides that are regulated under the Atomic Energy Act of 1954, as amended, and of negligible economic value considering the costs of recovery.

Real property	Land, permanent buildings, other inherently permanent structures and improvements, appurtenances, and fixtures located thereon.
Recycle	The process of reusing or reclaiming a material.
Restricted release	The release of a contaminated facility or equipment with restrictions to another Laboratory organization. This organization is then responsible for maintaining administrative and technical controls for the facility or equipment and for ensuring the protection of employees and the public. This type of facility or equipment shall not be released to the general public.
Surveillance & Maintenance (S&M)	Surveillance and maintenance activities are conducted throughout the facility life cycle phase including when a facility is not operating and is not expected to operate again and continues until phased out during decommissioning. Activities include providing in a cost effective manner periodic inspections and maintenance of structures, systems, and equipment necessary for the satisfactory containment of contamination and protection of workers, the public, and the environment.
Unrestricted release	Release of a (formerly contaminated) facility or equipment that meets the release requirements specified in DOE orders and state and federal law. (The ES&H Team can provide assistance with release criteria.) This type of facility or equipment may be released to the general public.

Appendix B

Guidelines for Preparing a Contamination Summary

A Contamination Summary is a brief document that outlines the current condition of a facility and equipment therein. (The term "facility" refers to the facility or building for which the summary is being prepared.) A Contamination Summary is usually required when a facility is transferred from one AD to another, when there is no longer a use for the facility, or when a D&D activity is being planned. A Contamination Summary may deviate from the format specified in this appendix. However, it shall be developed using a graded approach and include (or reference) all the information requested for the functional areas listed.

B.1 Introduction

A. Summary date. List the month, day, and year.

B. Assigned line responsibilities (including those of ADs) for the facility and equipment. List or attach the organizational chart with names and titles.

B.2 General Facility Information

A. Facility Name. State the name assigned to a specific structure under a contiguous roof or other property (e.g., Tritium or Plutonium Facility). Include closely related storage yards, waste accumulation areas, or similar areas and structures that would be included in the D&D effort.

B. Facility Number. List the assigned identification number of the facility (e.g., B332).

C. History and Use of Facility. Briefly summarize how the facility has been historically used (i.e., its mission) in about one or two paragraphs.

D. Facility Special Features. Identify special features that could affect D&D of the facility.

E. Overview of Facility Contamination and Materials. Briefly summarize the contamination status of the facility. Specify the primary contaminated areas, the types of contamination, and the level of contamination. Include chemicals, carcinogens, explosives, radioactive materials, and biohazards. List structural materials (e.g., asbestos or other hazardous materials) that would complicate the D&D effort.

F. Floor Plans. Attach floor plans (available from Plant Engineering) detailing the facility layout. Contaminated areas of the facility may be marked on the floor plans (optional).

G. Personal Property and Programmatic Equipment. List the equipment remaining in the facility that may be process contaminated, its location, and its status.

B.3 Facility Data (reference FSPS, IWS/SPs, or other documents)

A. Active Confinement Requirements. State whether active confinement is required (HEPA filtration of exhaust air, maintenance of differential atmospheric pressures, temperature control, etc.).

B. Confinement Integrity Status. Assess the integrity of the facility confinement systems and list their current maintenance category. Consider factors such as the adequacy of integrity design to meet today's requirements and the degree to which the confinement system meets its original specifications.

C. Percent of Gross Facility Contaminated. Estimate the percentage of the total floor area within the facility that is contaminated. More details may be required if DOE-EM is involved.

D. HEPA Filter Status. Include age, type, change schedule, and post sample characterization report.

Appendix C

Decontamination and Disposition Process

An Implementation Plan is required before beginning D&D work. The DOE-EM Office shall prepare the plan for work it manages or conducts. LLNL shall develop the plan using the guidelines in this appendix for work funded by DOE-EM or CSO and managed or conducted by LLNL. The format of the plan for D&D work is specified by the funding source. The format of the plan for D&D operations funded by LLNL is specified by the facility AD. (The facility AD for the facility is responsible for the actions specified in this appendix.)

For purposes of this document, it is assumed that (1) DOE has provided funds to prepare the Implementation Plan based on estimates given in the Funding Plan, and (2) funding will be provided in stages for large, complicated projects because the cost estimates are likely to change as new data are developed. (A copy of *Funding and Plans for Decontamination Projects* can be obtained form the AD facility manager.) Note that the Implementation Plan for large, complicated projects may require several iterations as detailed information becomes available. This approach presents the most extensive planning process. Simpler projects would require fewer iterations using a graded approach. ISM requirements for work planning and execution must be followed (refer to Document 2.2, "Managing ES&H for LLNL Work," in the *ES&H Manual).*

C.1 Characterization Phase

1. Describe in detail the sampling plan to be used to characterize the contaminated facility. Include a detailed cost and schedule estimate for obtaining the samples, performing the sample analysis, and reviewing the results.

   Note: It is possible that the first phase of characterization may indicate that additional samples will have to be collected and analyzed before work can proceed.

2. Request funding for the work described in this section.

3. If required, prepare a safety plan consistent with Document 2.2 and Document 3.3, "Facility Safety Plans and Integration Work Sheets with Safety Plans," in the *ES&H Manual.*

4. Prepare a level-of-effort estimate of the cost, then schedule the D&D effort based on the characterization data obtained from step 1.

5. Request funding for the "Planning Phase" (see Section C.2).

C.2 Planning Phase

1. Describe any sampling that will be required during the D&D process.
2. Describe in detail the processes required to accomplish D&D of the facility based on the characterization data obtained from Section C.1 and the contamination files.
3. Describe in detail the processes required for evaluating sampling data, characterizing waste, and identifying waste disposal options for wastes generated during D&D activities.
4. Outline any research or new techniques for handling unusual situations that might have been revealed in the characterization data.
5. Develop a detailed implementation plan with cost estimates, schedule, and milestones for the work described in step 2. The management of radioactive or mixed waste debris, equipment, and environmental media (soil, ground water) can be major cost factors that must be included in cost estimates. Prepare design reviews and justifications for the estimates.
6. Negotiate the details and estimates for the work with DOE.
7. Request funding for the D&D work in Section C.3.

C.3 Decontamination and Disposition Execution Phase

Safety must be maintained during the D&D period while conducting the tasks defined and performing the remaining day-to-day S&M activities. Integrating the normal S&M activities with the D&D tasks is critical to maintaining safety. One way to do this is by conducting pre-job briefings, which include the procedures to be used, a review of the hazards and adopted controls, a review of the emergency procedures, and consideration of all additional ongoing activities in the facility. This also provides an excellent opportunity to verify that all permits are in place, the emergency response plan is ready for implementation, and personnel have completed the appropriate training to accomplish the activity.

1. If required, prepare a safety plan consistent with the guidance in Document 2.2 and Document 3.3.
2. Perform the D&D work outlined in the Implementation Plan.
3. Conduct post-D&D sampling to verify that clearance criteria have been met.
4. Prepare a final D&D report describing the steps used, costs, schedule, and the post-D&D condition of the facility.

Note: It is possible that all phases will have to be repeated if additional contamination or undocumented facility features are uncovered during the execution phase. This may require negotiations of new budgets and schedules.

C.4 Feedback

While performing D&D tasks, project personnel **shall** ensure that hazard controls and work practices are monitored for adequacy. It is necessary to establish a feedback mechanism to provide information on unforeseen hazards and to develop corrective actions to better anticipate and mitigate them. The feedback system can also provide an avenue to review completed work activities and assess the need for additional controls or the removal of controls as a result of lowered risks in the facility.

The effectiveness of the feedback system can be ensured with management support and commitment. It is important that project personnel understand their rights and responsibilities related to maintaining safety and health during the course of the D&D project.

C.5 Project Closeout

The completion of the D&D project is determined by verifying that the end state has been achieved and the endpoints have been met. A final report is prepared after the technical work has been performed and verified that describes the decommissioning project activities, accomplishments, final facility status, and cost and performance information.